**DATA EVALUATION RECORD**
**Parasitic Wasp - Acute Contact and Reproduction Tests**
**No OPP Guideline Applicable**

1. **CHEMICAL:** Thidiazuron PC Code No.: 120301

2. **TEST MATERIAL:** AE B049537 00 SC42 A204 Purity: 41.9%

3. **CITATION:**

Author: Waltersdorfer, A.

Title: Toxicity to the parasitoid wasp *Aphidius rhopalosiphi* (DeStephani-Perez) (Hymenoptera: Braconidae) in the laboratory, Thidiazuron, Water miscible suspension concentrate 500 g/L

Study Completion Date: November 12, 2002

Laboratory: Bayer CropScience GmbH, Ecotoxicology
Industriepark Hochst
D-65926 Frankfurt am Main
Federal Republic of Germany

Sponsor: Bayer CropScience GmbH, Ecotoxicology
D-65926 Frankfurt am Main
Federal Republic of Germany

Laboratory Report ID: CW02/011

DP Barcode: D294536

MRID No.: 46203520

4. **REVIEWED BY:** Rebecca Bryan, Staff Scientist, Dynamac Corporation

**Signature:** **Date:** 5/3/04

**APPROVED BY:** Teri Myers, Ph.D., Staff Scientist, Dynamac Corporation

**Signature:** **Date:** 5/3/04

5. **APPROVED BY:** William Evans, Biologist, EFED/ERB-1

**Signature:** **Date:** 11/16/04

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**Signature:** **Date:** 5/3/04

5. **APPROVED BY:**

**Signature:** **Date:**

## 6. STUDY PARAMETERS:

**Scientific Name of Test Organism:** *Aphidius rhopalosiphi*

**Age and Size of Test Organism:** Adults, <48 hours old

**Definitive Study Duration:** 15 days total (48 hour mortality phase, 24 hour parasitation period, and 12 day reproduction phase)

**Type of Concentration:** Nominal

## 7. CONCLUSIONS:

The parasitic wasp, *Aphidius rhopalosiphi*, was exposed to Thidiazuron for 48 hours at concentrations of 100 and 200 g a.i./ha. After 48 hours, percent mortality in the 100 and 200 g a.i./ha treatment groups was 5 and 12.5%, respectively, as compared to 10% in the control. The corrected percent mortality was -5.6 and 2.8% in the 100 and 200 g a.i./ha treatment groups, respectively. Fifteen of the female wasps were placed on aphid-infested oat plants to determine reproductive success through parasitation. Percent reduction for reproduction success (number of mummies per wasp) was 27.3 and 38.1% in the 100 and 200 g a.i./ha treatment groups, respectively, after 14 days, as compared to the control. No differences for reproduction or mortality were statistically significant.

This study is scientifically sound, however, the study is a non-guideline study and does not fulfill an OPP guideline requirement. **The study is classified as Supplemental.**

$LC_{50}$: >200 g a.i./ha 95% C.I.: N/A
NOEC: 200 g a.i./ha Probit Slope: N/A
LOEC: >200 g a.i./ha

## 8. ADEQUACY OF THE STUDY:

**A. Classification:** Supplemental

**B. Rationale:** This study is scientifically sound, however it is a non-guideline study and does not fulfill an OPP guideline requirement.

**C. Repairability:** N/A

## 9. GUIDELINE DEVIATIONS:

This study is not an Office of Pesticides (OPP) guideline study and a protocol has not been developed by OPP.

## 10. SUBMISSION PURPOSE:

This study was submitted to provide supplemental data on the toxicity of the Thidiazuron to parasitic wasps on an acute contact and reproduction basis for the purposes of chemical reregistration.

## 11. MATERIALS AND METHODS:

### A. Test Organisms

| Criteria | Reported Information |
|---|---|
| **Species:** | *Aphidius rhopalosiphi* |
| **Age at beginning of test:** | Adults, <48 hours old (hatched from mummies provided by supplier) |
| **Supplier:** | Wasps supplied by PK Nutzlingszuchten, Welzheim. |
| **All wasps from same source?** | Yes |

### B. Test System

| Guideline Criteria | Reported Information |
|---|---|
| **Cage size adequate?** | The test units were made of two treated glass plates (100 x 100 x 3 mm) and an untreated acryl frame (92 x 92 x 14 mm inner size) with three ventilation holes on each side (one uncovered). See Figure 1, p.19. |
| **Lighting:** | 16 hour light/8 hour dark; Light intensity of 420-2420 lux in mortality phase and 11000-33000 lux in reproduction phase. |
| **Temperature:** | 20.0-20.5°C (short increase to 26°C) |
| **Relative humidity:** | 65-74% (short decline to 46%) |

**C. Test Design**

| Guideline Criteria | Reported Information |
|---|---|
| **Reference toxicant test?** | Reference toxicant test was performed using Dimethoate at 0.12 g a.i./ha. |
| **Method of administration**: | The test solutions were applied to the glass plates using a sprayer. The wasps were added after the spray coating had dried. |
| **Nominal doses**: | 100 and 200 g a.i./ha |
| **Controls:** Negative control and/or diluent/solvent control | Negative control (deionized water) |
| **Number of replicates:** | 4 replicates; 10 wasps/replicate |
| **Feeding:** | Feeding solution consisted of 3 parts water + 1 part honey. |
| **Observation period:** | 15 days total (48 hour mortality phase, 24 hour parasitation period, and 12 day reproduction phase) |
| **Reproduction effects method:** | After mortality phase, 15 healthy females were transferred to untreated acrylic cylinders containing aphid infested cereal (oat) plants. The females were removed after one day on plants. |

**12. REPORTED RESULTS:**

| Guideline Criteria | Reported Information |
|---|---|
| **Quality assurance and GLP compliance statements were included in the report?** | A GLP statement was provided; however, this study was not conducted in accordance with 40 CFR 160, Good Laboratory Practices. |
| **Control performance:** | 10% control mortality after 48 hours. |

| Guideline Criteria | Reported Information |
|---|---|
| **Raw data included:** | Replicate data was provided. |
| **Signs of toxicity (if any) were described?** | The reproduction effects included the parasitation rate (number of mummies per female wasp). |

**Table 1: Mortality Effects**

| Dosage, g a.i./ha | No. of wasps | Percent Mortality (%) | |
|---|---|---|---|
| | | Hour of Study | |
| | | 24 | 48 |
| Test Substance (Thidiazuron): | | | |
| Negative Control | 40 | 5 | 10 |
| 100 | 40 | 0 | 5 |
| 200 | 40 | 2.5 | 12.5 |
| Toxic Standard (Dimethoate): | | | |
| 0.12 | 40 | 97.5 | 100 |

**Table 2: Reproduction Effects**

| Dosage, g a.i./ha | 14 days after exposure | | |
|---|---|---|---|
| | Total No. of Mummies | Number of mummies per wasp | % Reduction |
| Negative Control | 399 | 26.6 | -- |
| 100 | 290 | 19.3 | 27.3 |
| 200 | 247 | 16.5 | 38.1 |

Observations:
After 48 hours, percent mortality in the 100 and 200 g a.i./ha treatment groups was 5 and 12.5%, respectively, as compared to 10% in the control. The corrected percent mortality was -5.6 and 2.8% in the 100 and 200 g a.i./ha treatment groups, respectively. Percent reduction for reproduction success (number of mummies per wasp) was 27.3 and 38.1% in the 100 and 200 g a.i./ha treatment groups, respectively, after 14 days, as compared to the control.

Statistical method: The $LD_{50}$ values were not calculated due to less than 50% mortality in all treatment groups. The NOEL and LOEL were determined based on mortalities. The mortalities were corrected according to the formula of Abbott (1925, p. 12).

## 13. VERIFICATION OF STATISTICAL RESULTS:

Mortality did not exceed 50% in this study and response was not dose-dependent. The number of mummies was analyzed and no differences were detected among the treatment and control groups using ANOVA.

$LD_{50}$: >200 g a.i./ha 95% C.I.: N/A
NOEL: 200 g a.i./ha Probit Slope: N/A
LOEL: >200 g a.i./ha

## 14. REVIEWER'S COMMENTS:

The reviewer's conclusions were similar to the study authors. There was no effect of treatment with thidiazuron to mortality or reproduction of the parasitoid wasp.

The test was conducted in compliance with the OECD Principles of Good Laboratory Practice, adopted November 26, 1997 [(C97) 186/Final] (p. 3).

The oat plants used for parasitation were planted 4 days prior to the start of the study with approximately 20 seeds each. One day after the study start, the plants were infected with *Rhopalosiphum padi* and the soil surface was covered with quartz sand.

The percent mortality for the reference toxicant, dimethoate, was 100% after 48 hours.

## 15. REFERENCES:

Abbott, W.S. 1925. A method of computing the effectiveness of an insecticide. J. of Econ. Entomol. 18, 265-267.

Mead-Briggs et al.: A laboratory test for evaluating the effects of plant protection products on the parasitic wasp, *Aphidius rhopalosiphi* (DeStephani-Perez) (Hymenoptera: Braconidae) in: Candolfi, M.P. et al. (eds.): Guidelines to evaluate side-effects of plant protection products to non-target arthropods. IOBC, BART, and EPPO Joint Initiative. IOBC/WPRS publication 2000, 13-25.

Candolfi, M.P. et al. (eds.) 2001: Guidance document on regulatory testing and risk assessment procedures for plant protection products with non-target arthropods. From the ESCORT 2 Workshop (European Standard Characteristics of Non-target Arthropod Regulatory Testing). Wageningen, The Netherlands, March 2001.

## APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

35-20 number of mummies
File: 35-20m Transform: NO TRANSFORMATION

ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|---|---|---|---|---|
| Between | 2 | 750.533 | 375.267 | 1.194 |
| Within (Error) | 42 | 13201.467 | 314.321 | |
| Total | 44 | 13952.000 | | |

Critical F value = 3.23 (0.05,2,40)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

35-20 number of mummies
File: 35-20m Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|---|---|---|---|---|---|
| 1 | neg control | 26.200 | 26.200 | | |
| 2 | 100 | 19.333 | 19.333 | 1.061 | |
| 3 | 200 | 16.467 | 16.467 | 1.504 | |

Dunnett table value = 1.97 (1 Tailed Value, P=0.05, df=40,2)

35-20 number of mummies
File: 35-20m Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|---|---|---|---|---|---|
| 1 | neg control | 15 | | | |
| 2 | 100 | 15 | 12.753 | 48.7 | 6.867 |
| 3 | 200 | 15 | 12.753 | 48.7 | 9.733 |

35-20 number of mummies
File: 35-20m Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

| GROUP | IDENTIFICATION | N | ORIGINAL MEAN | TRANSFORMED MEAN | ISOTONIZED MEAN |
|---|---|---|---|---|---|
| 1 | neg control | 15 | 26.200 | 26.200 | 26.200 |
| 2 | 100 | 15 | 19.333 | 19.333 | 19.333 |
| 3 | 200 | 15 | 16.467 | 16.467 | 16.467 |

35-20 number of mummies
File: 35-20m Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

| IDENTIFICATION | ISOTONIZED MEAN | CALC. WILLIAMS | SIG P=.05 | TABLE WILLIAMS | DEGREES OF FREEDOM |
|---|---|---|---|---|---|
| neg control | 26.200 | | | | |
| 100 | 19.333 | 1.061 | | 1.68 | k= 1, v=42 |
| 200 | 16.467 | 1.504 | | 1.76 | k= 2, v=42 |

s = 17.729
Note: df used for table values are approximate when v > 20.